

A New Species of *Helminthoglypta* from the Mojave Desert

BY

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(Plate 41; 2 Text figures)

IN 1930, S. S. BERRY DESCRIBED a new species of desert snail from the El Paso Mountains of the northern Mojave desert of California. With only shell characters for diagnosis, he named it *Micrarionta (Eremarionta) micrometalleus* S. S. BERRY, 1930. Subsequently he dissected adult specimens and determined that the anatomical characters were those of *Sonorella*. The shell characters, however, were different from those of other known *Sonorella*, and in 1943 he established a new subgenus *Mohavelix* to accommodate species of *Sonorella* with small, thin, subdiscoid, and widely umbilicated shells. Accordingly, *M. (E.) micrometalleus* became *Sonorella (Mohavelix) micrometalleus* (BERRY), the type and only species of *Mohavelix*.

Since 1964 I have been intensively studying *Sonorella* and in 1967 I submitted a revision of the genus to the University of Arizona as my doctoral dissertation. I became increasingly convinced that *Sonorella (Mohavelix) micrometalleus* did not share a close phylogeny with other *Sonorella*, *i. e.*, they did not evolve from the same immediate pre-*Sonorella* ancestor, and eventually proposed (MILLER, 1968) that *Mohavelix* should be raised to generic rank. The phylogeny of *Mohavelix* has remained obscure, however, with the most credible hypothesis being its derivation from some ancestral *Eremarionta*, possibly close to *Eremarionta aquaealbae* BERRY, 1922.

While attempting to obtain live specimens of *Mohavelix micrometalleus* from the arid southern slopes of the El Paso Mountains (the type locality is in the southern part of Last Chance Canyon) in early January 1969, I decided to search for more suitable rockslides on the more humid northern slopes of the range. I was rewarded by finding a gigantic north-facing slide which yielded 95 dead shells and 10 live specimens, of which 3 were adult. They looked in all respects like *M. micrometalleus*. Jubilant over this new find in a prolific locality, I was totally astonished to find that the anatomy revealed these snails to be a new species of *Helminthoglypta*, described below. The discovery of this population of *Helminthoglypta* in the El Paso Mountains, with shell and certain anatomical characters

remarkably similar to those of *M. micrometalleus*, has now afforded a more credible hypothesis for the derivation of this species. This hypothesis is also discussed below.

Helminthoglypta micrometalleoides W. B. MILLER,
spec. nov.

(Plate 41, Figures 1 and 2; Text figure 1)

Description of Holotype: Shell very small for the genus, depressed, discoid, thin, light-brown, with a darker brown spiral band on the well-rounded shoulder; widely umbilicate, the umbilicus contained about 6 times in the diameter of the shell. Embryonic shell of about $1\frac{3}{4}$ whorls, with faint, microscopic wrinkles. Post-embryonic whorls with minute granular wrinkles and papillae. Body whorl with spirally-descending, long, hyphen-like papillae occasionally confluent to form long threads, superimposed over the radial ridges, persisting into the umbilicus; periostracum thin, silky-lustrous. The last whorl descends slightly to the scarcely expanded, thin peristome; aperture oblique, relatively large.

Shell Measurements: Height 5.6 mm, maximum diameter 10.9 mm, umbilicus 1.7 mm. Number of whorls $4\frac{1}{4}$.

The animal: The animal, when extended, has a dark-grey to black body wall, with scattered white glandular papillae. The mantle collar shows a thick mat of white mucus glands, giving the collar an overall whitish appearance; the area around the pneumostome is chalk-white. The mantle above the lung is pigmented with small, black, closely-spaced spots.

The Genitalia: The genitalia (Text figure 1) are typical for the genus. The penis is strongly swollen in the middle where the internal tube, detached from the external wall, becomes thickened and forms a papilla which can be likened to a very short verge. Anteriorly, it consists of a hollow, eversible sac. Distally, it merges into the epiphal-

lus where the internal tube becomes completely adnate to the external wall. The epiphallus is of uniform diameter and is equipped with a moderately long epiphallic caecum at its distal end. The penial retractor muscle originates on the floor of the lung and is inserted on the epiphallus near the penial end. The vagina is short, equal

in length to the saccular proximal end of the penis. The free oviduct is longer than the vagina. The long spermathecal duct gives rise to a diverticulum about halfway along its length; the diverticulum is about equal in length to that part of the spermathecal duct posterior to their junction. The globular spermatheca is bound by connective tissue to the posterior end of the uterus. The muscular dart sac is small, globular, and situated at the summit of a longer atrial sac; it contains a short, conical dart. The two side-by-side mucus bulbs join proximally into a single duct which enters the atrial sac at its junction with the dart sac; distally, each mucus bulb connects with a thin, glandular, U-shaped duct which passes into a broad, thin membrane enveloping the entire dart apparatus and much of the lower genitalia. Dimensions, in millimeters, of distinctive structures follow:

Penis	5.0 mm
Epiphallus	7.0 mm
Epiphallic caecum	8.0 mm
Penial retractor	3.5 mm
Spermathecal duct	14.5 mm
Spermathecal diverticulum	8.5 mm
Vagina	2.0 mm
Free oviduct	3.0 mm

Type Locality: El Paso Mountains, Kern County, California, in north-facing, high rockslide of small rocks, between crag outcroppings on south side of Iron Canyon Road, at a point 3 miles up the canyon from the junction of the road with the Garlock-Goler highway (W.B. Miller, 5 January 1969).

Disposition of Specimens:

Holotype: deposited in the California Academy of Sciences, Geology Type Collection, no. 13169.

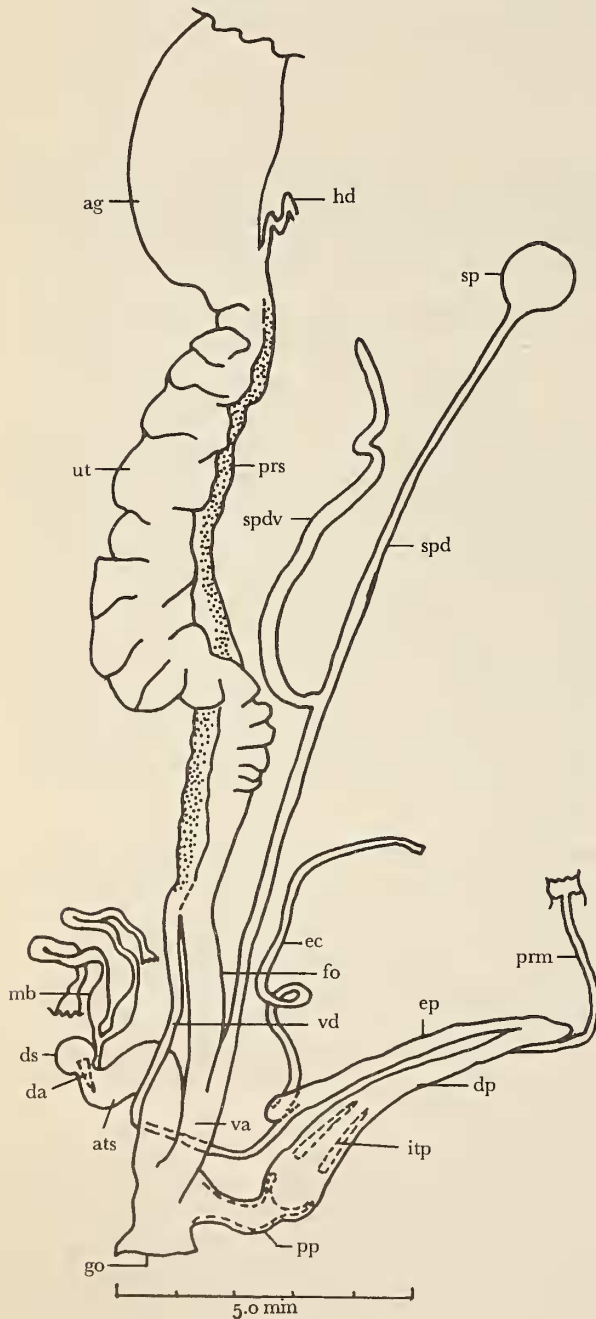


Figure 1

(← adjacent column)

Helminthoglypta micrometalleoides W. B. MILLER, spec. nov.

Lower genitalia of holotype; drawing made from projection of stained whole mount. Scale in millimeters >

- ag albumen gland ats atrial sac da dart
- dp distal part of penis ds dart sac
- ec epiphallic caecum ep epiphallus fo free oviduct
- go genital orifice hd hermaphroditic duct
- itp internal tube of penis mb mucus bulb
- pp proximal part of penis prm penial retractor muscle
- prs prostate sp spermatheca spd spermathecal duct
- spd spermathecal diverticulum ut uterus
- va vagina vd vas deferens



Figure 1



Figure 2



Figure 3



Figure 4

Figures 1, 2: *Helminthoglypta micrometalleoides* W. B. MILLER, spec. nov. Holotype. California Academy of Sciences, Geology Type collection no. 13169. El Paso Mountains, Kern County, California. Scale in millimeters

Figures 3, 4: *Mohavelix micrometalleus* (BERRY, 1930). El Paso Mountains, Kern County, California. Scale in millimeters

